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Establishing a new species group of *Pseudopoda* Jäger, 2000 with the description of two new species (Araneae, Sparassidae)

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Abstract

The huntsman spider genus *Pseudopoda* Jäger, 2000 contains 140 species worldwide, of which 61 have been described from China. In this paper, this knowledge is increased by the description of two new species from Yunnan Province in China. These new species, *P. physematosa* **sp. nov.** (♀) and *P. semilunata* **sp. nov.** (♂♀), are treated with five previously described ones, *P. bibulba* Xu & Yin, 2000 (♂♀), *P. signata* Jäger, 2001 (♂♀), *P. wu* Jäger, Li & Krehenwinkel, 2015 (♂♀), *P. yinae* Jäger & Vedel, 2007 (♂), and *P. yunnanensis* Yang & Hu, 2001 (♂♀), as the newly defined *Pseudopoda signata* species group. The *P. signata* group can be distinguished from other groups within *Pseudopoda* by the male palps with long, slightly broad, S-shaped embolus, small but distinct tegular apophysis, pronounced dRTA and reduced vRTA, and by the female with V-shaped or W-shaped anterior margins of lateral lobes, membranous and wide first winding, long and strongly curved SIDS (sclerotised internal duct system), the latter mostly covered by the first winding. The monophyly of this group is also supported by molecular phylogenetic results mainly based on Chinese *Pseudopoda* species. In addition, photographs of *P. bibulba* (♂♀), *P. signata* (♂♀), and *P. yunnanensis* (♂♀) are provided. *P. bibulba* is newly recorded from Guizhou Province and *P. signata* is newly recorded from Yunnan Province.

Keywords

Biodiversity, systematics, taxonomy, huntsman spiders, China

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Introduction

Jäger (2000) proposed the huntsman spider genus *Pseudopoda* by re-describing *P. prompta* (O. Pickard-Cambridge, 1885) from Pakistan and India. Since then, no fewer than 140 species have been assigned to this genus, which is now known to occur in areas from South, East and Southeast Asia. Of this diversity, 61 species have been recorded from China (World Spider Catalog 2019). Known species are mainly collected in the leaf litter, underneath tree bark, under stones and on plants (Jäger and Vedel 2007).

Jäger (2001) established six species groups within the genus according to morphological evidences based on species mostly collected from Himalayas and nearby mountain ranges: *P. diversipunctata* group, *P. latembola* group, *P. martensi* group, *P. parvipunctata* group, *P. prompta* group, and *P. schwendingeri* group. Nevertheless, the monophyly of these groups has never been tested by any phylogenetical analysis. Cao et al. (2016) published a molecular phylogeny on Chinese *Pseudopoda* species based on COI and ITS2 genes data, focusing on DNA barcoding of this genus, without discussing species groups. Zhang et al. (2017) established the seventh *Pseudopoda* group (*P. daliensis* group including five species from Yunnan Province, China) based on morphological and molecular data which are mostly cited from Cao et al. (2016). So far, only 47 (33.57%) species were assigned to species groups, since it is challenging to group species exclusively according to morphological data of a limited set of species. Jäger (2001) described *P. signata* but did not assign it to any species group considering the female a transitional form between the *prompta* group and the *martensi* group. Here, we expand the baseline data for such decision by evaluating molecular (Fig. 1, edited from Zhang et al. 2017: fig. 1) as well as morphological evidence (see taxonomy), and establish the *P. signata* group, to which we assign seven species, two of which new to science, from Guizhou, Sichuan, and Yunnan provinces in China.

Material and methods

All specimens were preserved in 75% ethanol and examined with an Olympus SZX16 stereomicroscope; details were further investigated with an Olympus BX51 compound microscope. Male and female copulatory organs were examined and illustrated after dissection from the spider bodies, vulvae were cleared with Proteinase K. Habitus photos were obtained using a Leica 205C digital microscope.

Leg measurements are shown as: total length (femur, patella, tibia, metatarsus, tarsus). The numbers of spines are listed for each segment in the following order: prolateral, dorsal, retrolateral, ventral (in femora and patellae, ventral spines are absent, and the fourth digit is omitted in the spination formula). The body size classes and illustration of schematic course of internal duct system follow Jäger (2001). The terminology used in the text and figure legends follows Quan et al. (2014). All measurements are in millimetres.

We evaluated the most recent phylogenetic evidence for relationships among various *Pseudopoda* species (Fig. 1, edited from Zhang et al. 2017: fig. 1). For detailed phylogenetic methods and abbreviations see Cao et al. (2016) and Zhang et al. (2017).

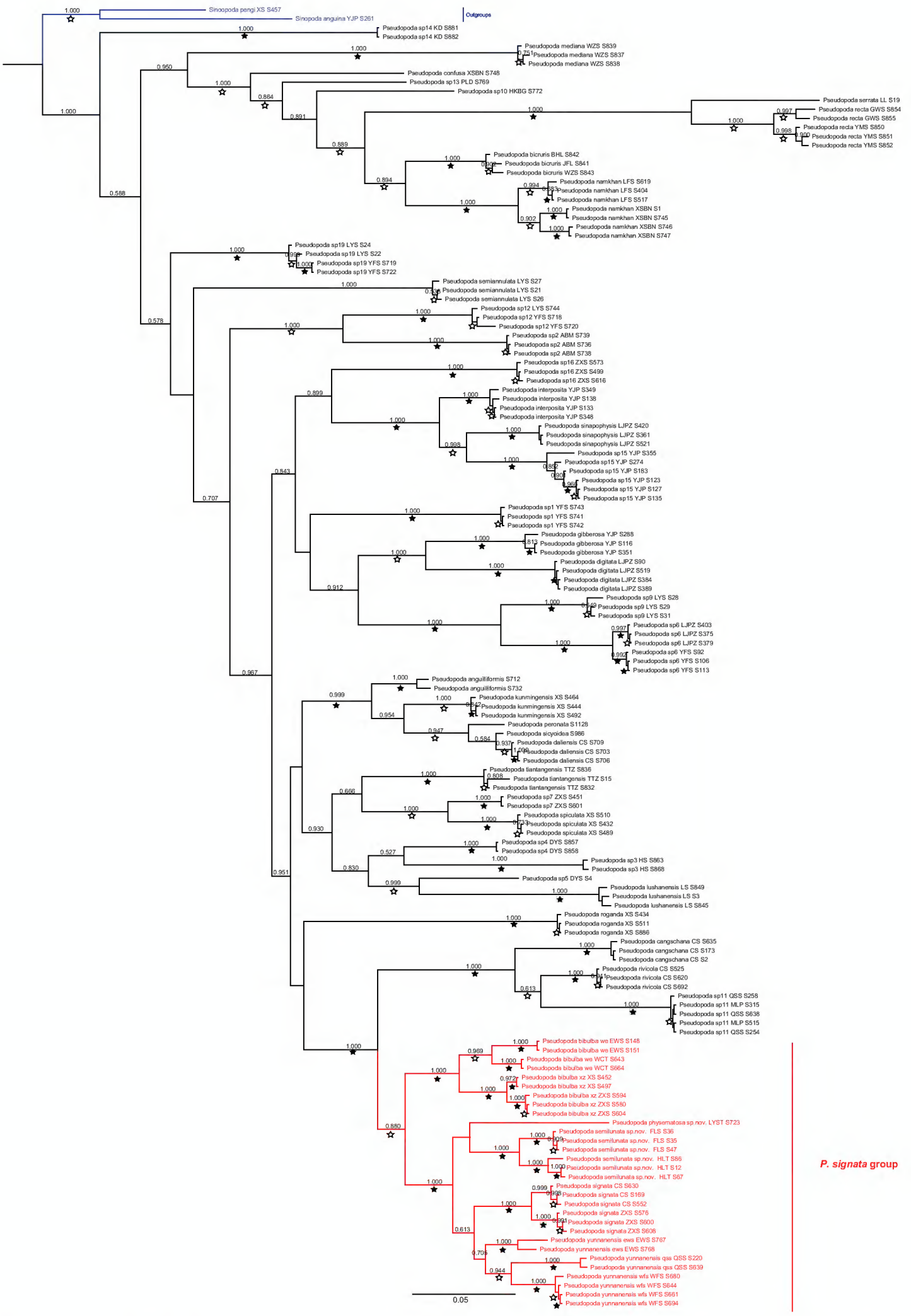
Outgroups
Sinopoda pengi XS S457
Sinopoda anguina YJP S261
Pseudopoda sp14 KD S881
Pseudopoda sp14 KD S882
Pseudopoda mediana WZS S839
Pseudopoda mediana WZS S837
Pseudopoda mediana WZS S838
Pseudopoda confusa XSBN S748
Pseudopoda sp13 PLD S769
Pseudopoda sp10 HKBG S772
Pseudopoda serrata LL S19
Pseudopoda recta GWS S854
Pseudopoda recta GWS S855
Pseudopoda recta YMS S850
Pseudopoda recta YMS S851
Pseudopoda recta YMS S852
Pseudopoda bicruris BHL S842
Pseudopoda bicruris JFL S841
Pseudopoda bicruris WZS S843
Pseudopoda namkhan LFS S619
Pseudopoda namkhan LFS S404
Pseudopoda namkhan LFS S517
Pseudopoda namkhan XSBN S1
Pseudopoda namkhan XSBN S745
Pseudopoda namkhan XSBN S746
Pseudopoda namkhan XSBN S747
Pseudopoda sp19 LYS S24
Pseudopoda sp19 LYS S22
Pseudopoda sp19 YFS S719
Pseudopoda sp19 YFS S722
Pseudopoda semiannufata LYS S27
Pseudopoda semiannulata LYS S21
Pseudopoda semiannulata LYS S26
Pseudopoda sp12 LYS S744
Pseudopoda sp12 YFS S718
Pseudopoda sp12 YFS S720
Pseudopoda sp2 ABM S739
Pseudopoda sp2 ABM S736
Pseudopoda sp2 ABM S738
Pseudopoda sp16 ZXS S573
Pseudopoda sp16 ZXS S499
Pseudopoda sp16 ZXS S616
Pseudopoda interpositа YJP S349
Pseudopoda interpositа YJP S138
Pseudopoda interpositа YJP S133
Pseudopoda interpositа YJP S348
Pseudopoda sinapophysis LJPZ S420
Pseudopoda sinapophysis LJPZ S361
Pseudopoda sinapophysis LJPZ S521
Pseudopoda sp15 YJP S355
Pseudopoda sp15 YJP S274
Pseudopoda sp15 YJP S183
Pseudopoda sp15 YJP S123
Pseudopoda sp15 YJP S127
Pseudopoda sp15 YJP S135
Pseudopoda sp1 YFS S743
Pseudopoda sp1 YFS S741
Pseudopoda sp1 YFS S742
Pseudopoda gibberosa YJP S288
Pseudopoda gibberosa YJP S116
Pseudopoda gibberosa YJP S351
Pseudopoda digitata LJPZ S90
Pseudopoda digitata LJPZ S519
Pseudopoda digitata LJPZ S384
Pseudopoda digitata LJPZ S389
Pseudopoda sp9 LYS S28
Pseudopoda sp9 LYS S29
Pseudopoda sp9 LYS S31
Pseudopoda sp6 LJPZ S403
Pseudopoda sp6 LJPZ S375
Pseudopoda sp6 LJPZ S379
Pseudopoda sp6 YFS S92
Pseudopoda sp6 YFS S106
Pseudopoda sp6 YFS S113
Pseudopoda anguilliformis S712
Pseudopoda anguilliformis S732
Pseudopoda kunmingensis XS S464
Pseudopoda kunmingensis XS S444
Pseudopoda kunmingensis XS S492
Pseudopoda peronata S1128
Pseudopoda sicyoidea S986
Pseudopoda daliensis CS S709
Pseudopoda daliensis CS S703
Pseudopoda daliensis CS S706
Pseudopoda tiantangensis TTZ S836
Pseudopoda tiantangensis TTZ S15
Pseudopoda tiantangensis TTZ S832
Pseudopoda sp7 ZXS S451
Pseudopoda sp7 ZXS S601
Pseudopoda spiculata XS S510
Pseudopoda spiculata XS S432
Pseudopoda spiculata XS S489
Pseudopoda sp4 DYS S857
Pseudopoda sp4 DYS S858
Pseudopoda sp3 HS S863
Pseudopoda sp3 HS S868
Pseudopoda sp5 DYS S4
Pseudopoda lushanensis LS S849
Pseudopoda lushanensis LS S3
Pseudopoda lushanensis LS S845
Pseudopoda roganda XS S434
Pseudopoda roganda XS S511
Pseudopoda roganda XS S886
Pseudopoda cangschana CS S635
Pseudopoda cangschana CS S173
Pseudopoda cangschana CS S2
Pseudopoda rivicola CS S525
Pseudopoda rivicola CS S620
Pseudopoda rivicola CS S692
Pseudopoda sp11 QSS S258
Pseudopoda sp11 MLP S315
Pseudopoda sp11 QSS S638
Pseudopoda sp11 MLP S515
Pseudopoda sp11 QSS S254
Pseudopoda bibulba we EWS S148
Pseudopoda bibulba we EWS S151
Pseudopoda bibulba we WCT S643
Pseudopoda bibulba we WCT S664
Pseudopoda bibulba xz XS S452
Pseudopoda bibulba xz XS S497
Pseudopoda bibulba xz ZXS S594
Pseudopoda bibulba xz ZXS S580
Pseudopoda bibulba xz ZXS S604
Pseudopoda physematosa sp.nov. LYST S723
Pseudopoda semilunata sp.nov. FLS S36
Pseudopoda semilunata sp.nov. FLS S35
Pseudopoda semilunata sp.nov. FLS S47
Pseudopoda semilunata sp.nov. HLT S56
Pseudopoda semilunata sp.nov. HLT S12
Pseudopoda semilunata sp.nov. HLT S67
Pseudopoda signata CS S630
Pseudopoda signata CS S169
Pseudopoda signata CS S552
Pseudopoda signata ZXS S576
Pseudopoda signata ZXS S600
Pseudopoda signata ZXS S606
Pseudopoda yunnanensis ews EWS S767
Pseudopoda yunnanensis ews EWS S768
Pseudopoda yunnanensis qsa QSS S220
Pseudopoda yunnanensis qsa QSS S639
Pseudopoda yunnanensis wfs WFS S680
Pseudopoda yunnanensis wfs WFS S644
Pseudopoda yunnanensis wfs WFS S661
Pseudopoda yunnanensis wfs WFS S694
P. signata group
0.05

Figure 1. Bayesian tree based on the COI + ITS2 dataset including 144 *Pseudopoda* individuals belonging to 44 species. Numbers on nodes are posterior probabilities; bootstrap support from ML analyses is indicated as solid stars for values > 95%, open stars > 50–95%. Red clade indicates the *P. signata* group, blue clade indicates the outgroups. Phylogenetic tree cited from Zhang et al. (2017).

Abbreviations used throughout the text are given below.
Somatic morphology:

ALE anterior lateral eyes;
AME anterior median eyes;
CH clypeus height;
CO copulatory opening;
dRTA dorsal part/branch of RTA;
DS dorsal shield of prosoma;
E embolus;
Fe femur;
FD fertilisation duct;
FW first winding;
Mt metatarsus;
OS opisthosoma;
Pa patella;
PLE posterior lateral eyes;
PME posterior median eyes;
Pp palp;
RTA retrolateral tibial apophysis;
SIDS sclerotised internal duct system;
ST subtegulum;
T tegulum;
Ti tibia;
I, **II**, **III**, **IV** – legs I to IV;
vRTA ventral part/branch of RTA.

Institutes:

CBEE Centre for Behavioural Ecology and Evolution, College of Life Sciences, Hubei University, Wuhan, China;
HUST School of Nuclear Technology and Chemistry & Biology, Hubei University of Science and Technology, Xianning, Hubei, China;
SWUC College of Life Sciences, Southwest University, Chongqing, China.

Taxonomy

Family Sparassidae Bertkau, 1872
Subfamily Heteropodinae Thorell, 1873
Genus *Pseudopoda* Jäger, 2000
***Pseudopoda signata* group**

Definition. This group can be recognised by the combination of the following characters:

1. Embolus distinctly longer than tegulum, slightly S-shaped, arising from tegulum between 7- AND 9-o'clock-position (Fig. 2A);
2. Tegulum with distinctly short tegular outgrowth (Fig. 2A);
3. dRTA pronounced, vRTA short, dRTA two times longer than vRTA (Fig. 2A);
4. Anterior margins of lateral lobes bent medially, roughly "U" or "V"-shaped (Fig. 2B);
5. First winding membranous and wide, covering large part of the sclerotised internal duct system (Fig. 2D);

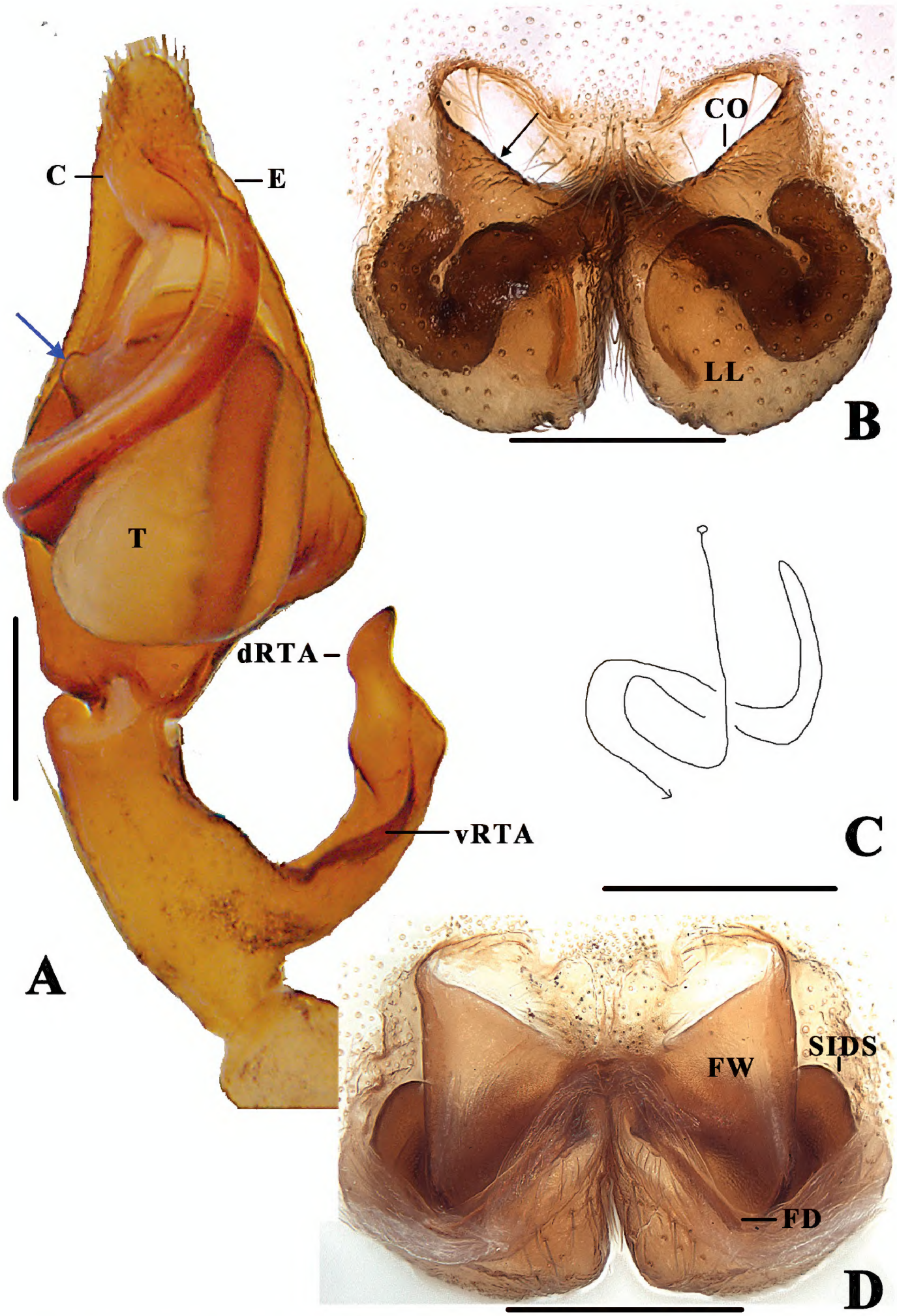

Figure 2. *Pseudopoda bibulba* Xu & Yin, 2000 **A** left male palp, ventral **B** epigyne, ventral **C** schematic course of internal duct system in right part, dorsal **D** vulva, dorsal. Black arrow pointing to anterior margin of lateral lobe, blue arrow to tegular outgrowth. Abbreviations: C–conductor; dRTA–dorsal retrolateral tibial apophysis; E–embolus; vRTA–ventral retrolateral tibial apophysis; T–tegulum; CO–copulatory opening; LL–lateral lobes; FD–fertilisation duct; FW–first winding; SIDS–sclerotised internal duct system. Scale bars: 0.5 mm.

6. Sclerotised part of internal duct system long, strongly curved, tube-shaped (Fig. 2D).

Composition. *P. bibulba* Xu & Yin, 2000, *P. physematosa* sp. nov., *P. semilunata* sp. nov., *P. signata* Jäger, 2001, *P. wu* Jäger, Li & Krehenwinkel, 2015, *P. yinae* Jäger & Vedel, 2007, *P. yunnanensis* Yang & Hu, 2001.

Distribution. China (Guizhou, Sichuan, Yunnan provinces) (Fig. 18).

Pseudopoda bibulba Xu & Yin, 2000

Figs 2–4, 18

Heteropoda bibulba Xu & Yin, 2000: 37, figs 1–3 (description of female).
Pseudopoda bibulba: Jäger & Yin, 2001: 126 (transfer from *Heteropoda*); Jäger & Vedel, 2007: 15, figs 44–59 (description of male, redescription of female).

Material examined. CHINA, *Guizhou Province:* 3 females, Liupanshui City, Zhongshan District, Xianshui slope martyr cemetery, 26.61°N, 104.84°E, 1966 m, 11 April 2016, Yang Zhong, Yang Zhu & He Zhang leg. (CBEE, LJ02358-LJ02360); ***Yunnan Province:*** 19 males, 14 females, Kunming City, Xishan Scenic Area, 24.96°N, 102.63°E, 1975 m, 14 May 2014, Yang Zhong & Xiaowei Cao leg. (CBEE, LJ02361-LJ02393); 1 female, Kunming City, Xishan Scenic Area, 24.96°N, 102.63°E, 2204 m, 13 October 2016, Guiqiang Huang, Xiangbo Guo and Yanchao Wang leg. (CBEE, LJ02394); 19 males, 14 females, Chuxiong City, Zixishan Scenic Area, 25.01°N, 101.42°E, 2527 m, 15 May 2014, Yang Zhong & Xiaowei Cao leg. (CBEE, LJ02395-LJ02427); 5 males, 3 females, Nujiang Lisu Autonomous Prefecture, Lanping Bai Nationality Autonomous Prefecture, Mt. Erwu, 26.43°N, 99.41°E, 2377 m, 28 May 2014, Yang Zhong & Xiaowei Cao leg. (CBEE, LJ02428-LJ02435); 6 males, 5 females, Wei Xi Lisu Autonomous County, Pagoda of Cultural Prosperity, 27.18°N, 99.29°E, 2294 m, 26 May 2014, Yang Zhong & Xiaowei Cao leg. (CBEE, LJ02436-LJ02446).

Diagnosis and Description. See Jäger and Vedel (2007).

Distribution. China (Guizhou, new province record; Yunnan) (Fig. 18).

Pseudopoda physematosa sp. nov.

http://zoobank.org/8AD4A005-5F68-438F-997A-32F410F14B7A

Figs 5–7, 18

Type material. Holotype female: CHINA: *Yunnan Province:* Lijiang City, Yongsheng County, Lingyuan Temple, 26.70°N, 100.78°E, 2305 m, 25 August 2013, Yang Zhong & Xiaowei Cao leg. (CBEE, LJ01667); **Paratypes:** 2 females, with same data as holotype. (CBEE, LJ01668-LJ01669).

Etymology. The specific name is derived from the Latin adjective *physematosus*, *-a*, *-um*, meaning swollen, referring to the shape of SIDS in dorsal view (Fig. 5C); adjective.

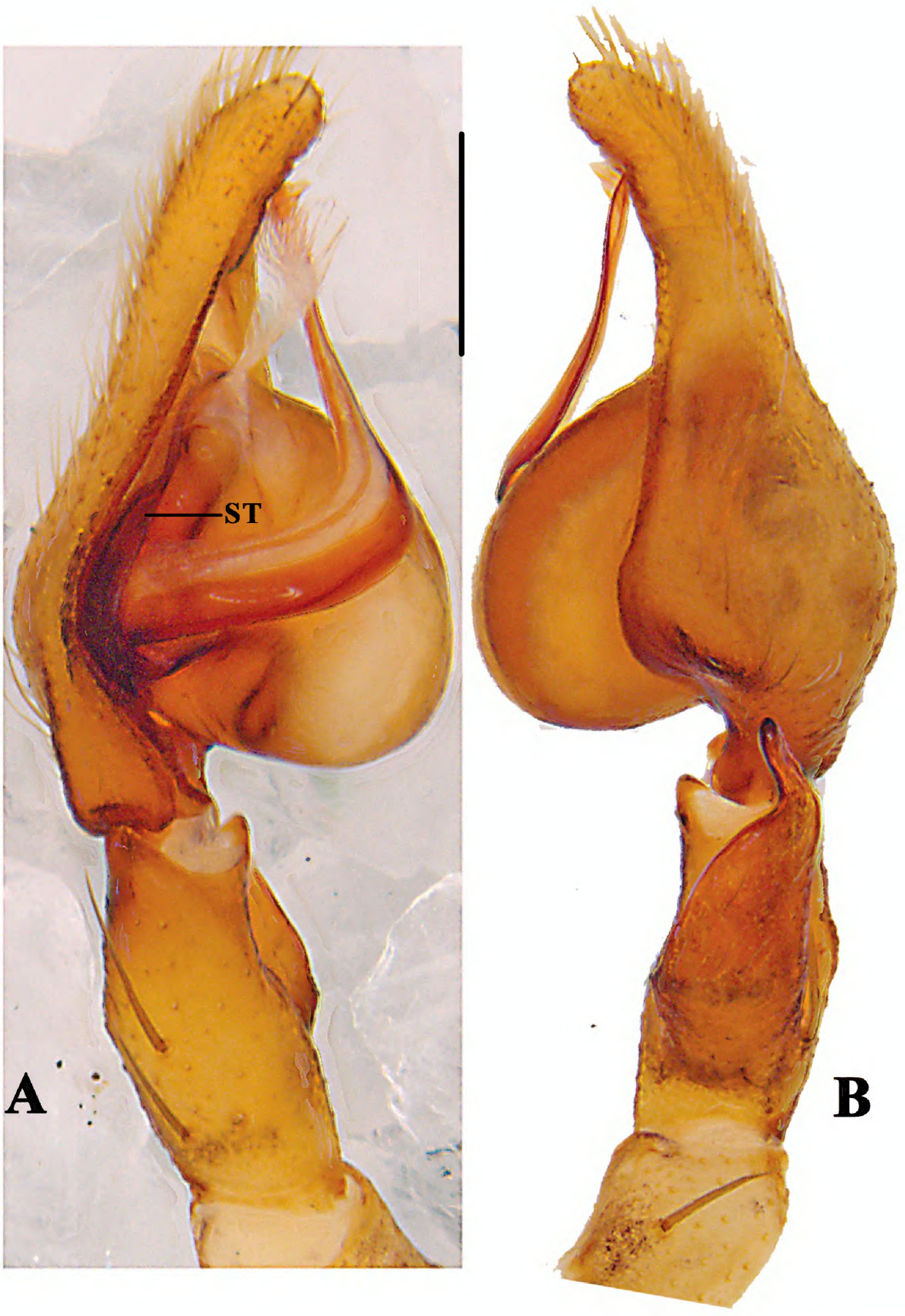

Figure 3. *Pseudopoda bibulba* Xu & Yin, 2000 **A** left male palp, prolateral **B** same, retrolateral. Abbreviation: ST–subtegulum. Scale bar: 0.5 mm.

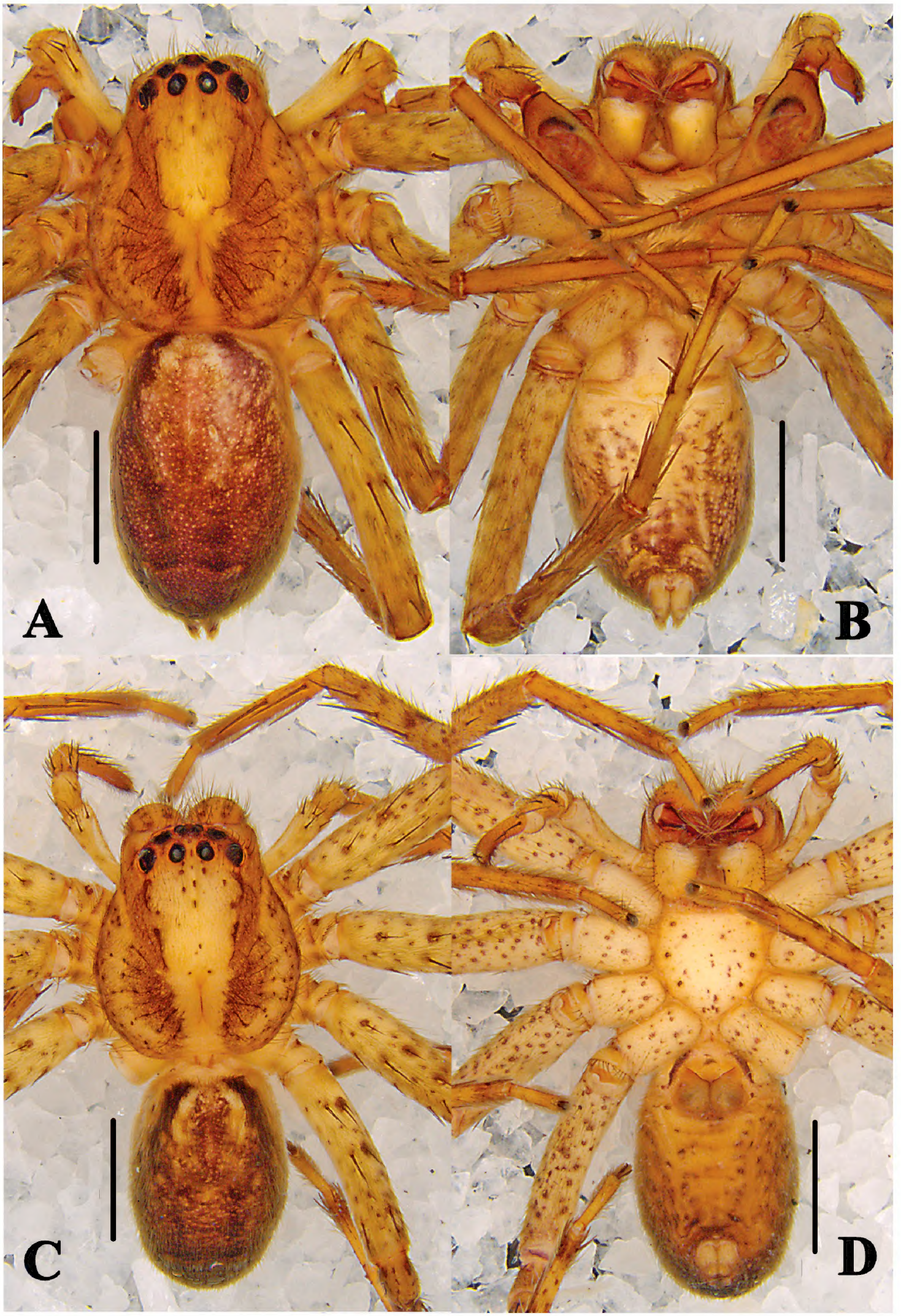

Figure 4. *Pseudopoda bibulba* Xu & Yin, 2000 **A, B** male habitus (**A** dorsal **B** ventral) **C, D** female habitus (**C** dorsal **D** ventral). Scale bars: 2 mm.

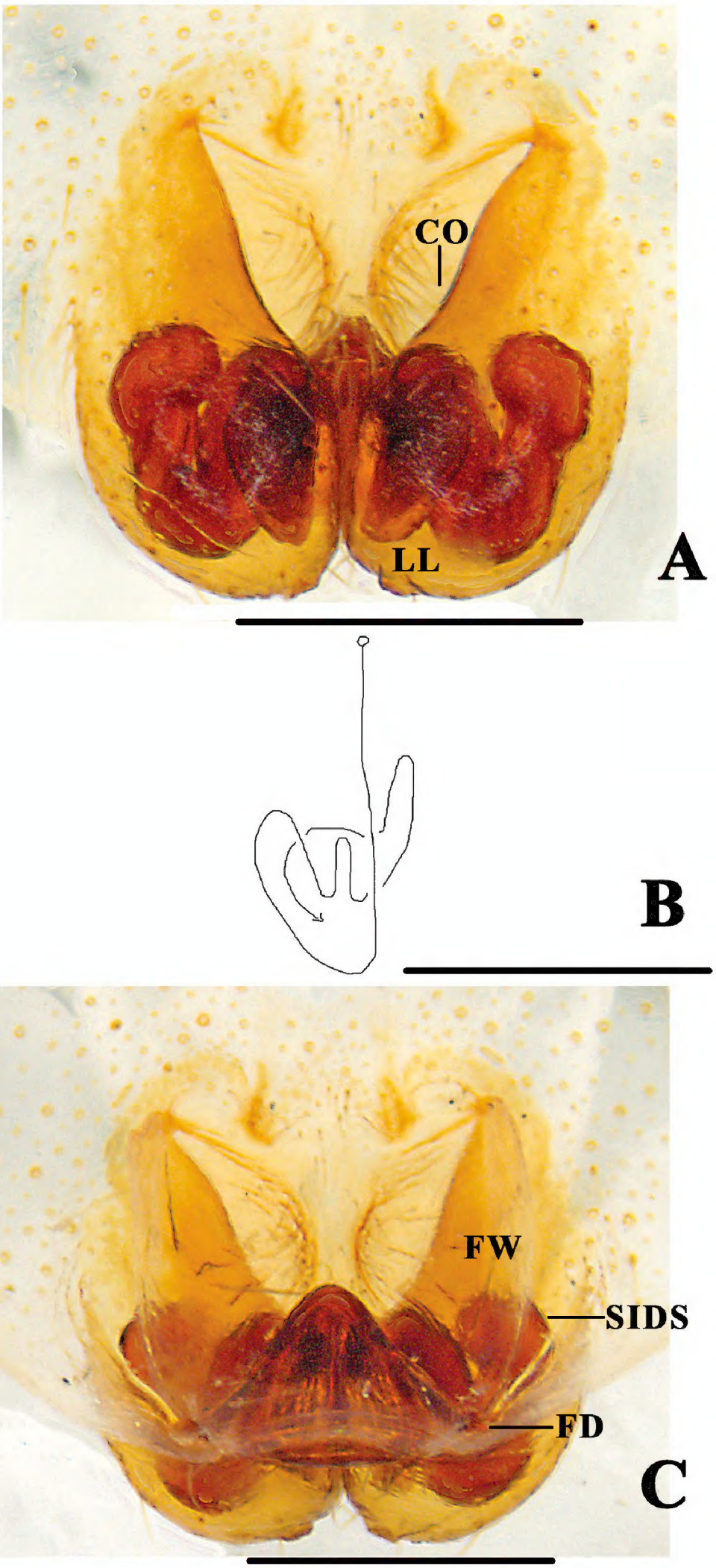

Figure 5. *Pseudopoda physematosa* sp. nov. **A** epigyne, ventral **B** schematic course of internal duct system, dorsal **C** vulva, dorsal. Abbreviations: CO–copulatory opening; FD–fertilisation duct; FW–first winding; LL–lateral lobes; SIDS–sclerotised internal duct system. Scale bars: 0.5 mm.

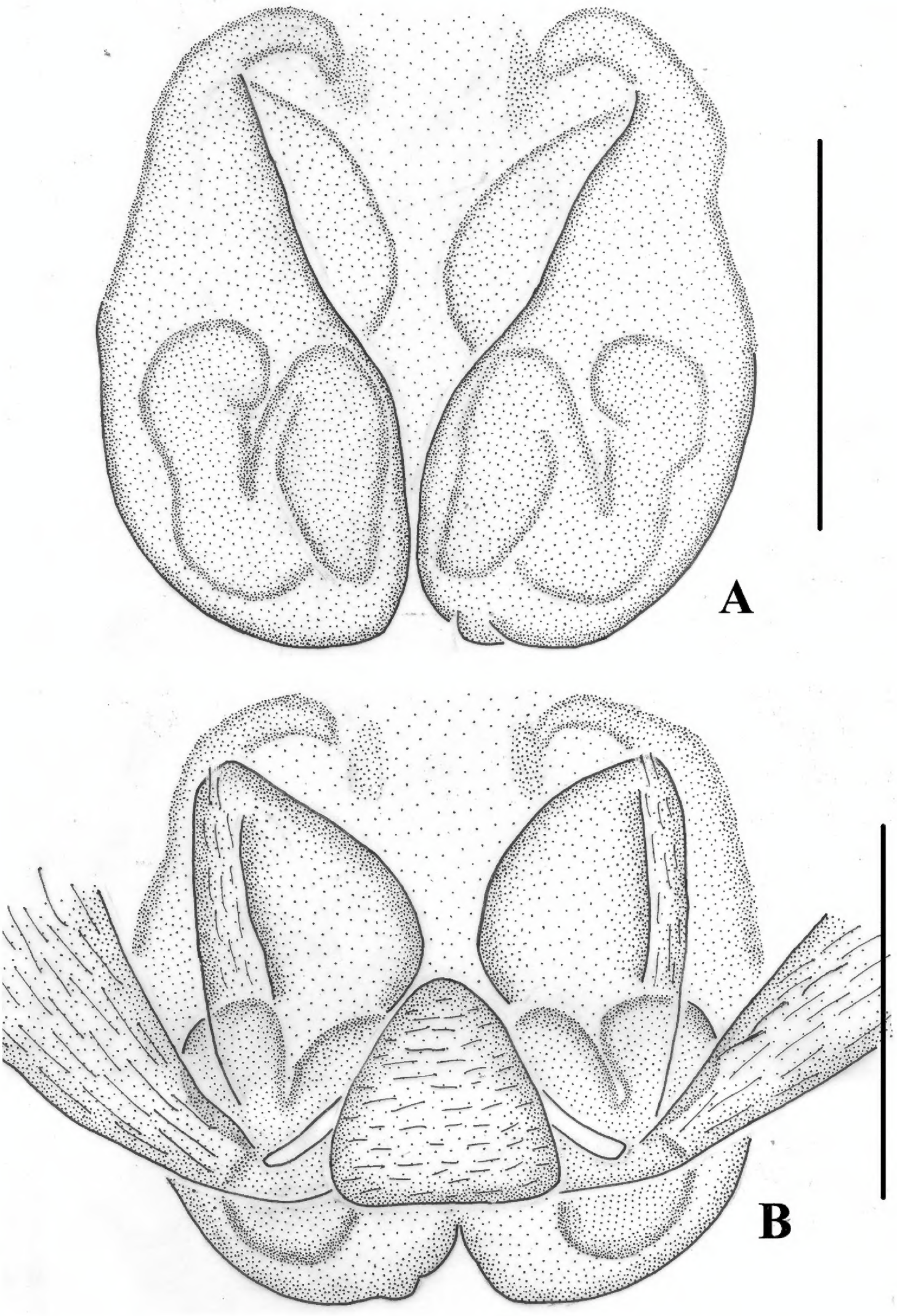

Figure 6. *Pseudopoda physematosa* sp. nov. **A** epigyne, ventral **B** vulva, dorsal. Scale bars: 0.5 mm.

Figure 7. *Pseudopoda physematosa* sp. nov. Female habitus (**A** dorsal **B** ventral). Scale bars: 2 mm.

Diagnosis. *Pseudopoda physematosa* sp. nov. differs from other species of the *P. signata* group, except *P. bibulba*, by the SIDS with well developed twisted loops, in ventral view. It can be distinguished from *P. bibulba* by the following characters: anterior margins of lateral lobes longer than half the width of epigynal field in *P. physematosa*, but shorter in *P. bibulba;* SIDS folded, with swollen tip in *P. physematosa*, but not in *P. bibulba* (Fig. 5A).

Description. Male unknown**. Female (holotype)**: Measurements: small-sized Heteropodinae. Body length 8.6–9.9. DS length 4.4, width 3.3, OS length 5.5, width 3.6. Eyes: AME 0.24, ALE 0.31, PME 0.18, PLE 0.22, AME-AME 0.18, AME-ALE 0.11, PME-PME 0.15, PME-PLE 0.24, AME-PME 0.27, ALE-PLE 0.24, CH AME 0.35, CH ALE 0.28. Leg formula: II-I-IV-III. Spination: Pp 131, 101, 2121, 1014; Fe I–II 323, III 322, IV 322; Pa I–III 101, IV 100; Ti I–II 2228, III–IV 2126; Mt I–II 2024, III 3025, IV 3036. Measurement of palps and legs: Pp 4.5 (1.3, 0.5, 1.0, -, 1.7); I 12.8 (3.8, 1.9, 2.8, 3.1, 1.2); II 13.0 (4.0, 1.3, 3.0, 3.2, 1.5); III 11.1 (3.1, 1.6, 2.7, 2.6, 1.1); IV 11.6 (3.1, 1.7, 3.0, 2.7, 1.1). Promargin of chelicerae with three teeth, retromargin with four teeth, cheliceral furrow with ca. 32 denticles. Epigynal field almost as wide as long, with anterior bands included in the field. Epigyne with lateral lobes touching each other posteriorly. The anterior margins of lateral lobes forming a "V". FW covering most of SIDS, the latter folded in the middle part (Fig. 5A–C). Col-

ouration in ethanol: DS yellow with irregular radially arranged dark spots and brown patterns. Fovea and radial furrows distinctly marked. OS dorsally with light yellow hairs and large patches of reddish brown spots, ventrally lighter with larger and sparser reddish brown marks (Fig. 7A, B).

Distribution. China (Yunnan) (Fig. 18).

Pseudopoda semilunata sp. nov.

http://zoobank.org/42780378-AF52-41DB-8447-C71F62523204

Figs 8–11, 18

Type material. Holotype male: CHINA: ***Yunnan Province:*** Lijiang City, Black Dragon Pool Park, 26.89°N, 100.24°E, 2659 m, 20 May 2014, Yang Zhong & Xiaowei Cao leg. (CBEE, LJ01905); **Paratypes:** 7 males, 8 females, with same data as holotype. (CBEE, LJ01906-LJ01920); 2 males, 2 females, Diqing Tibetan Autonomous Prefecture, Deqin County, Fei Lai Temple scenic area, 28.42°N, 98.87°E, 3458m, 25 May 2014, Yang Zhong & Xiaowei Cao leg. (CBEE, LJ01921-LJ01924).

Etymology. The specific name is derived from the Latin adjective *semilunatus*, *-a*, *-um*, meaning lunate, referring to the shape of anterior margins of lateral lobes (Fig. 8B–D); adjective.

Diagnosis. *P. semilunata* sp. nov. differs from other members in this group by the following characters: dRTA with distinct sub-apical cavity, anterior margins of lateral lobes not strongly curved as in other species but together forming a semicircle. Males of this species are similar to those of *P. wu* in having a twisted embolus tip but can be distinguished by embolic tip forming a semicircle and conductor present (embolic tip forming a full circle, conductor entirely reduced in *P. wu*) (Figs 8A–D, 9A, B).

Description. Male (holotype): Measurements: small-sized Heteropodinae. Body length 7.0–9.5. DS length 4.1, width 3.5, OS length 5.0, width 3.4. Eyes: AME 0.16, ALE 0.23, PME 0.19, PLE 0.24, AME-AME 0.13, AME-ALE 0.21, PME-PME 0.24, PME-PLE 0.27, AME-PME 0.37, ALE-PLE 0.40, CH AME 0.26, CH ALE 0.21. Leg formula: II-I-IV-III. Spination: Pp 131, 101, 2121, 1014; Fe I–II 323, III 322, IV 322; Pa I–III 101, IV 100; Ti I–II 2228, III–IV 2126; Mt I–II 2024, III 3025, IV 3036. Measurement of palps and legs: Pp 5.0 (1.3, 0.6, 0.9, -, 2.2); I 13.9 (3.9, 1.0, 3.6, 4.0, 1.4); II 14.3 (4.1, 1.2, 4.2, 3.3, 1.5); III 12.2 (3.5, 0.9, 3.4,3.0, 1.4); IV 13.7 (4.5, 1.2, 3.3, 3.2, 1.5). Promargin of chelicerae with three teeth, retromargin with four teeth, cheliceral furrow with ca. 20 denticles. Palp as in diagnosis. Conductor arising from tegulum at 12-o'clock-position, basally folded. Tegular outgrowth short, claviform. Embolus arising from tegulum at 8.30-o'clock-position, long, well developed, with abruptly tapering apical part with additional loop. Spermophore visible submarginally on retrolateral tegulum in ventral view. RTA arising proximally on Ti, with broad ventral part, its distal end bent, bowl-shaped (Figs 8A, 9A, B). Colouration in ethanol: DS yellow with dark spots, two lateral bands, margin with thin dash line and brown patterns. Fovea and radial furrows distinctly marked. OS dorsally with lots of reddish brown dots, ventrally with reddish brown marks, regularly arranged (Fig. 11A, B).

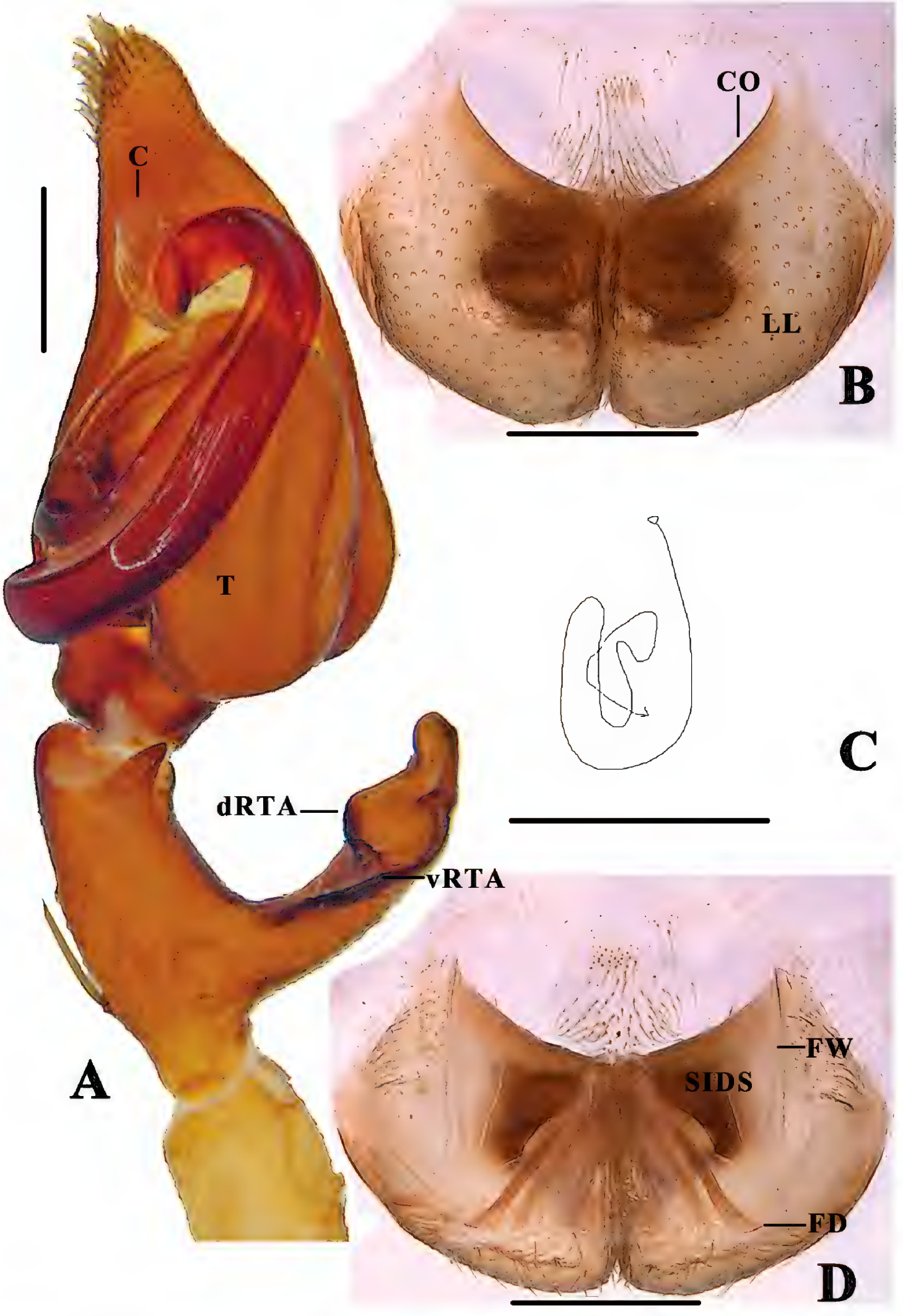

Figure 8. *Pseudopoda semilunata* sp. nov. **A** left male palp, ventral **B** epigyne, ventral **C** schematic course of internal duct system in right art, dorsal **D** vulva, dorsal. Abbreviations: C–conductor; dRTA–dorsal retrolateral tibial apophysis; T–tegulum; vRTA–ventral retrolateral tibial apophysis; CO–copulatory opening; LL–lateral lobes; FD–fertilisation duct; FW–first winding; SIDS–sclerotised internal duct system. Scale bars: 0.5 mm.

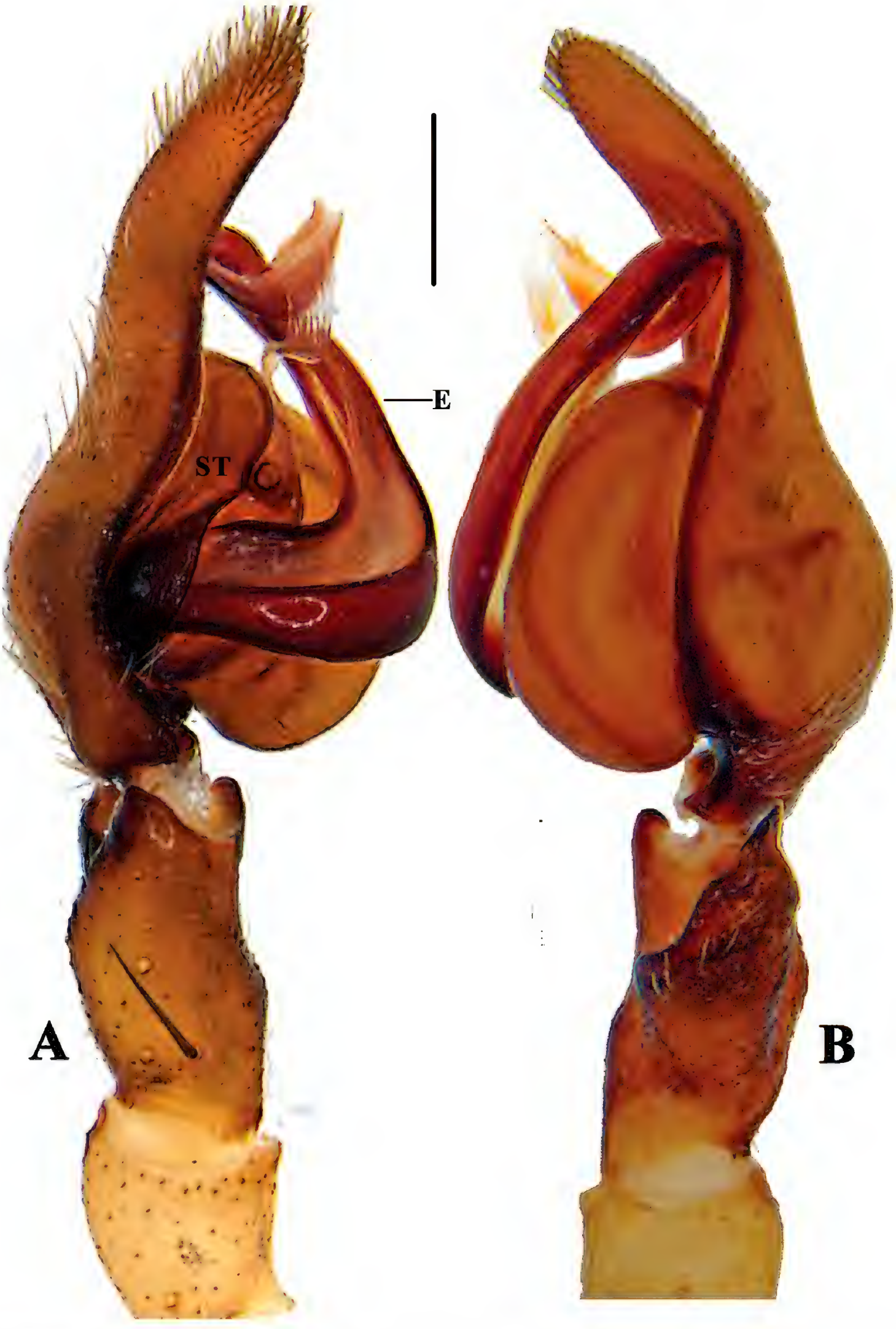

Figure 9. *Pseudopoda semilunata* sp. nov. **A** left male palp, prolateral **B** Same, retrolateral. Abbreviations: E-embolus; ST-subtegulum. Scale bar: 0.5 mm.

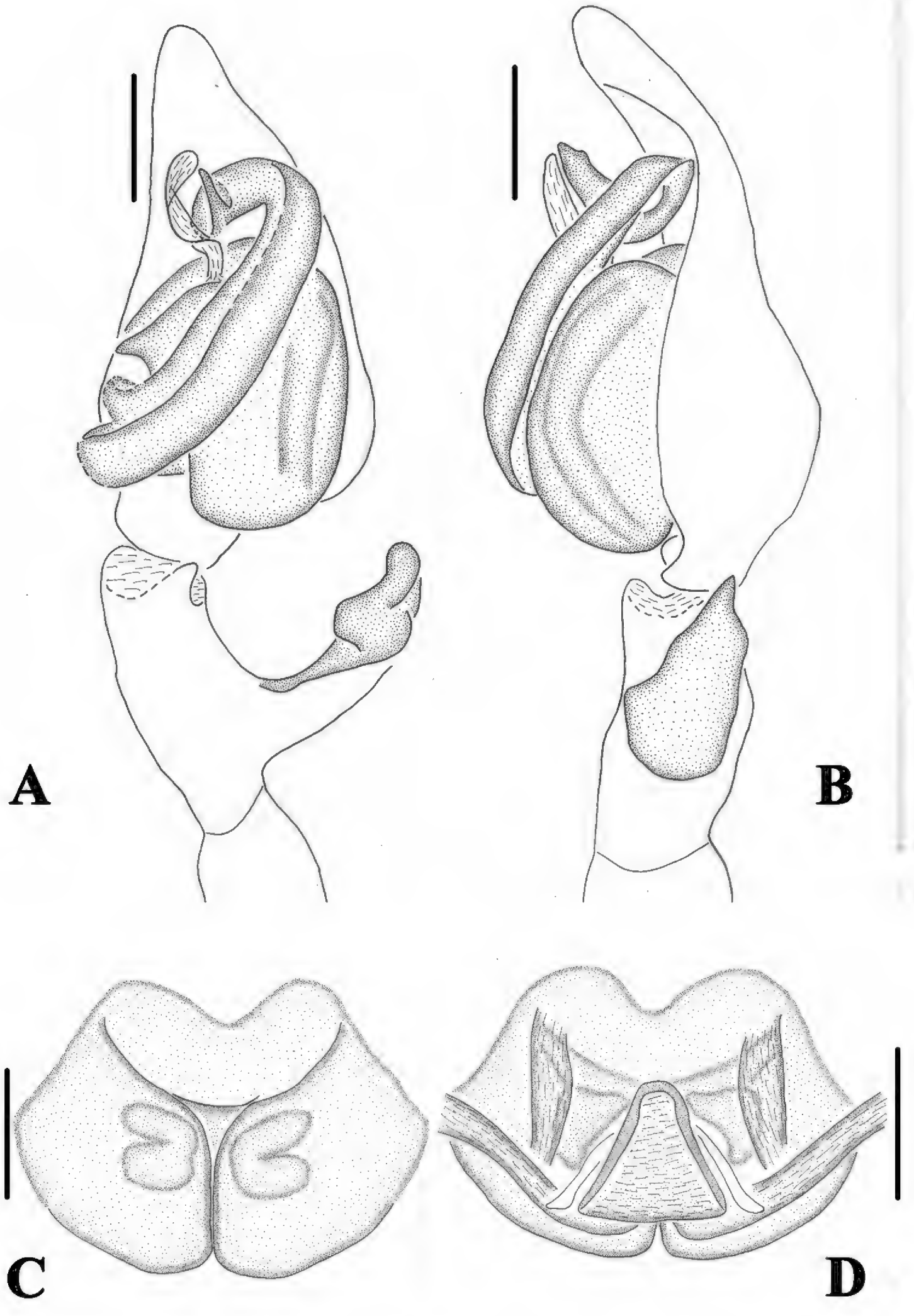

Figure 10. *Pseudopoda semilunata* sp. nov. **A, B** left male palp (**A** ventral **B** retrolateral) **C** epigyne, ventral **D** vulva, dorsal. Scale bars: 0.5mm.

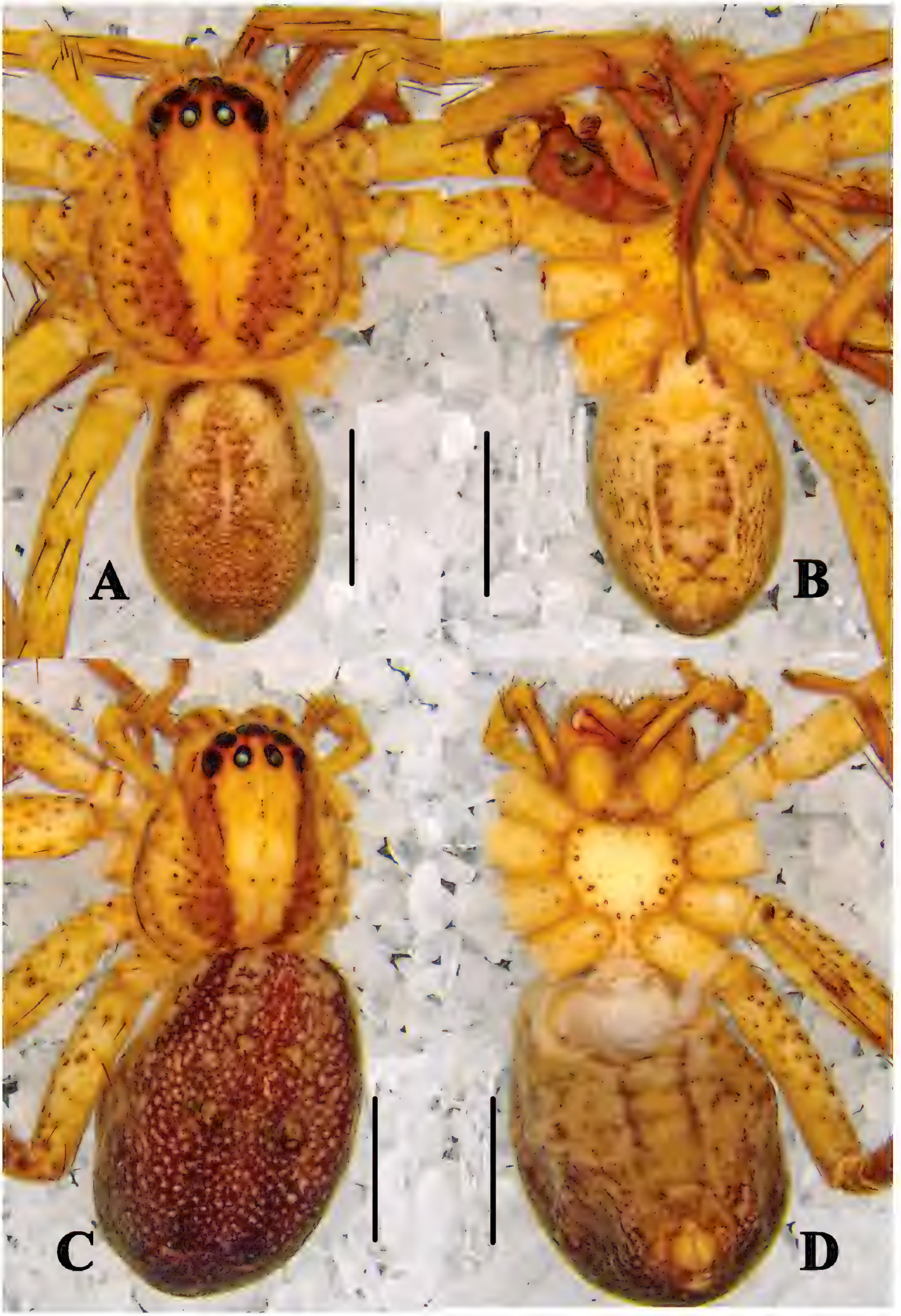

Figure 11. *Pseudopoda semilunata* sp. nov. **A, B** male habitus (**A** dorsal **B** ventral) **C, D** female habitus (**C** dorsal **D** ventral). Scale bars: 2 mm.

Female: Measurements: small-sized Heteropodinae. Body length 8.0–9.5. DS length 4.0, width 3.6, OS length 4.6, width 2.8. Eyes: AME 0.15, ALE 0.20, PME 0.16, PLE 0.20, AME-AME 0.27, AME-ALE 0.13, PME-PME 0.33, PME-PLE 0.41, AME-PME 0.35, ALE-PLE 0.32, CH AME 0.31, CH ALE 0.29. Leg formula: II-I-IV-III. Spination: Pp 131, 101, 2121, 1014; Fe I–II 323, III 322, IV 322; Pa I–III 101, IV 100; Ti I–II 2228, III–IV 2126; Mt I–II 2024, III 3025, IV 3036. Measurements of palps and legs: Pp 4.4 (1.3, 0.6, 0.9, -, 1.6); I 9.9 (3.1, 0.8, 2.6, 2.4, 1.0); II 10.9 (3.1, 1.2, 3.0, 2.6, 1.0); III 7.3 (1.9, 0.8, 2.2, 1.5, 0.9); IV 8.8 (2.8, 0.8, 2.4, 2.0, 0.8). Cheliceral furrow with three anterior and four posterior teeth, and with ca. 18 denticles. Epigynal field wider than long. Anterior and posterior margins of lateral lobes almost parallel. FW well developed, covering the entire sclerotised part of internal duct system, the latter folded. FD long, narrow (Fig. 8B–D). Colouration in ethanol: As in male, generally darker (Fig. 11C, D).

Distribution. China (Yunnan) (Fig. 18).

Pseudopoda signata Jäger, 2001

Figs 12–14, 18

Pseudopoda signata Jäger, 2001: 50, f. 29h-j (description of female).
Pseudopoda signata: Jäger et al. 2015: 375, f, 55–90, 93–106 (description of male, re-description of female); Jäger, 2015: 349, fig. 98 (illustration of male).

Material examined. CHINA, *Yunnan Province:* 6 males, 7 females, Dali Bai Autonomous Prefecture, Cangshan Scenic Area, 25.01°N, 100.14°E, 2645 m, 17 May 2014, Yang Zhong & Xiaowei Cao leg. (CBEE, LJ01695-LJ01707); 12 males, 6 females, Chuxiong City, Zixishan Scenic Area, 25.01°N, 101.42°E, 2476 m, 15 May 2014, Yang Zhong & Xiaowei Cao leg. (CBEE, LJ01708-LJ01719, LJ01785-LJ01790).

Diagnosis and Description. See Jäger et al. (2015).

Distribution. China (Yunnan, new province record; Sichuan) (Fig. 18).

Pseudopoda yunnanensis Yang & Hu, 2001

Figs 15–18

Sinopoda yunnanensis Yang & Hu, 2001: 18, figs 1–3 (description of female).
Pseudopoda yunnanensis: Jäger & Vedel, 2007: 17, figs 60–62 (Transfer from *Sinopoda*); Yang & Chen, 2008: 810, figs 1–13 (Description of male, redescription female).

Material examined. CHINA, *Yunnan Province:* 2 males, 2 females, Nujiang Lisu Autonomous Prefecture, Lanping Bai Nationality Autonomous Prefecture, Mt. Erwu, 26.43°N, 99.41°E, 2366 m, 28 May 2014, Yang Zhong & Xiaowei Cao leg. (CBEE, LJ01535-LJ01538); 42 males, 26 females, Diqing Tibetan Autonomous Prefecture, Shangri-La County, Mt. Wufeng, 27.18°N, 99.29°E, 3528 m, 23 May 2014, Yang

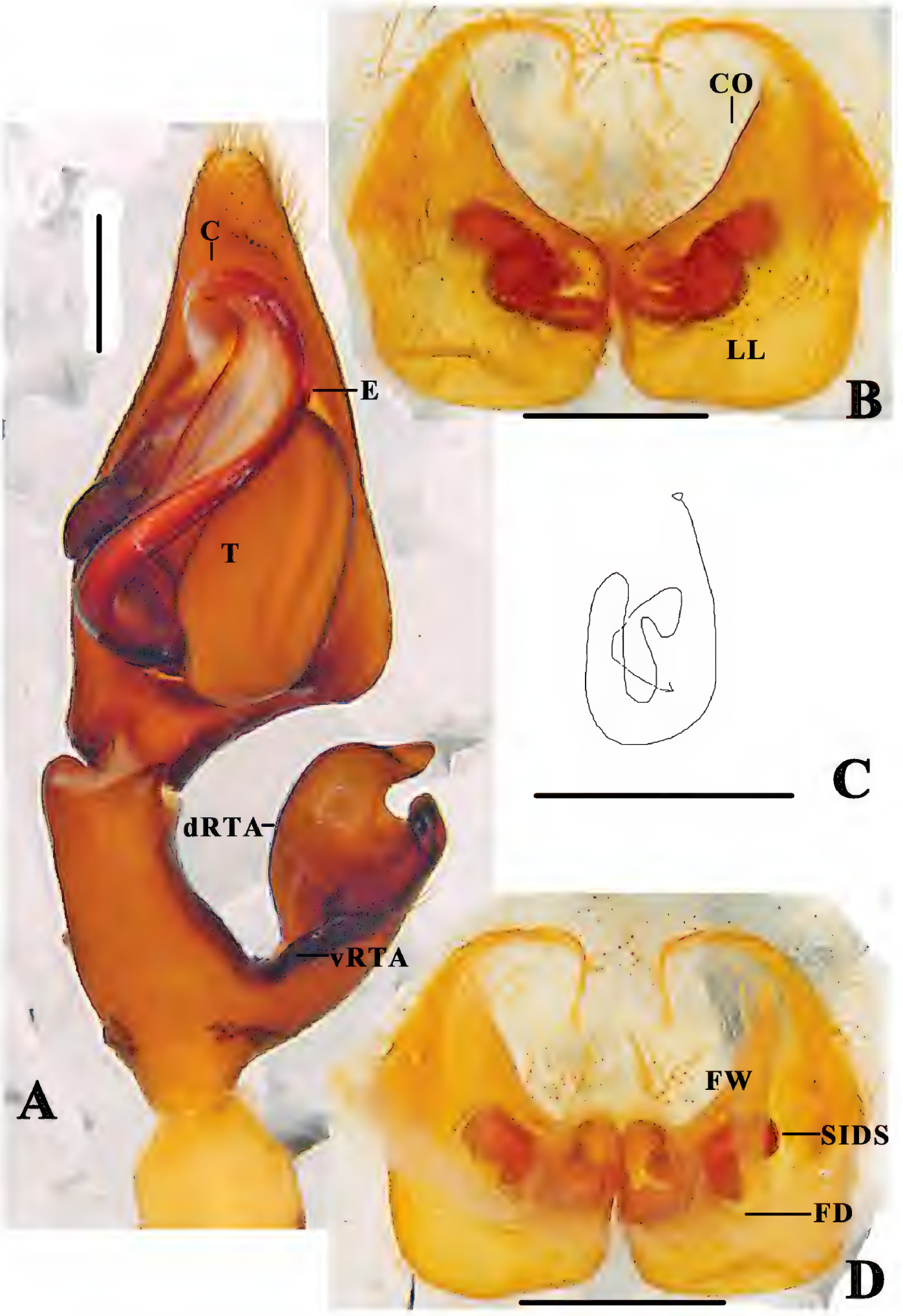

Figure 12. *Pseudopoda signata* Jäger, 2001 **A** left male palp, ventral **B** epigyne, ventral **C** schematic course of internal duct system in right part, dorsal **D** vulva, dorsal. Abbreviations: C–conductor; E–embolus; dRTA–dorsal retrolateral tibial apophysis; T–tegulum; vRTA–ventral retrolateral tibial apophysis; CO–copulatory opening; LL–lateral lobes; FD–fertilisation duct; FW–first winding; SIDS–sclerotised internal duct system. Scale bars: 0.5 mm.

Figure 13. *Pseudopoda signata* Jäger, 2001 **A** left male palp, prolateral **B** same, retrolateral. Abbreviation: ST–subtegulum. Scale bar: 0.5 mm.

Figure 14. *Pseudopoda signata* Jäger, 2001 **A, B** male habitus (**A** dorsal **B** ventral) **C, D** female habitus (**C** dorsal **D** ventral). Scale bars: 2 mm

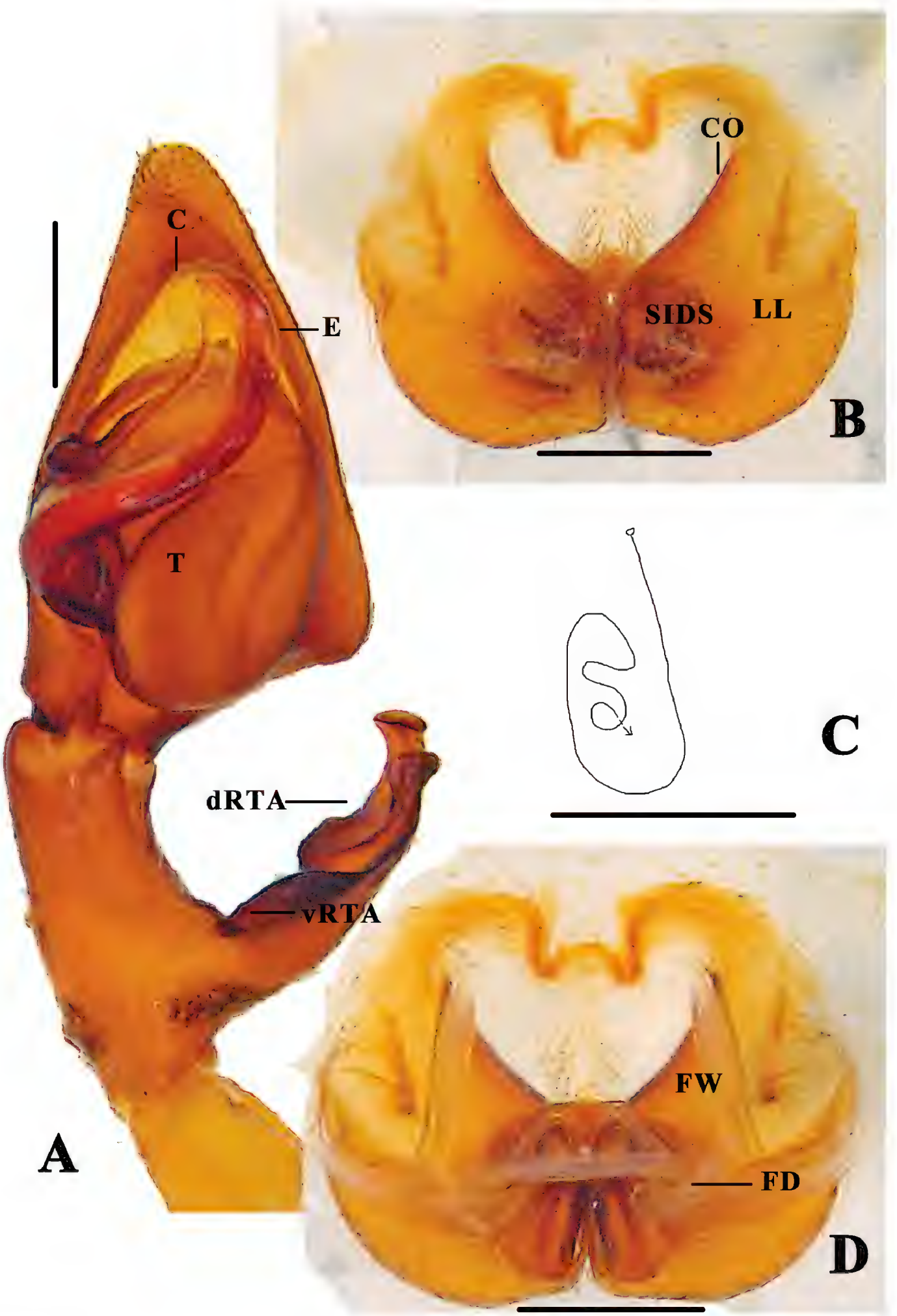

Figure 15. *Pseudopoda yunnanensis* Yang & Hu, 2001 **A** left male palp, ventral **B** epigyne, ventral **C** Schematic course of internal duct system in right part, dorsal **D** vulva, dorsal. Abbreviations: C–conductor; dRTA–dorsal retrolateral tibial apophysis; E–embolus; vRTA–ventral retrolateral tibial apophysis; T–tegulum; CO–copulatory opening; LL–lateral lobes; FD–fertilisation duct; FW–first winding; SIDS–sclerotised internal duct system. Scale bars: 0.5 mm.

Figure 16. *Pseudopoda yunnanensis* Yang & Hu, 2001 **A** left male palp, prolateral **B** same, retrolateral. Abbreviation: ST–subtegulum. Scale bar: 0.5mm.

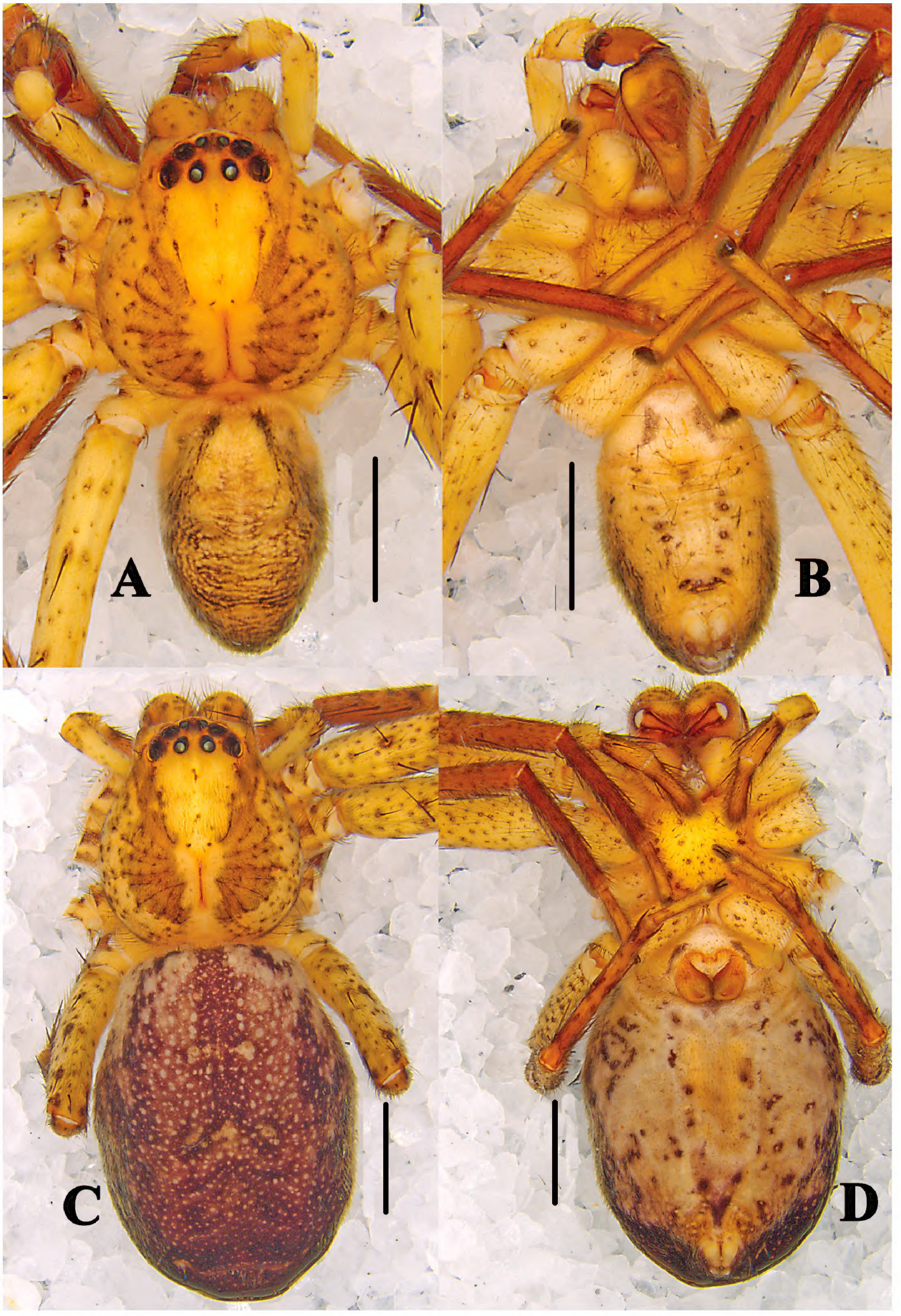

Figure 17. *Pseudopoda yunnanensis* Yang & Hu, 2001 **A, B** male habitus (**A** dorsal **B** ventral) **C, D** female habitus (**C** dorsal **D** ventral). Scale bars: 2 mm

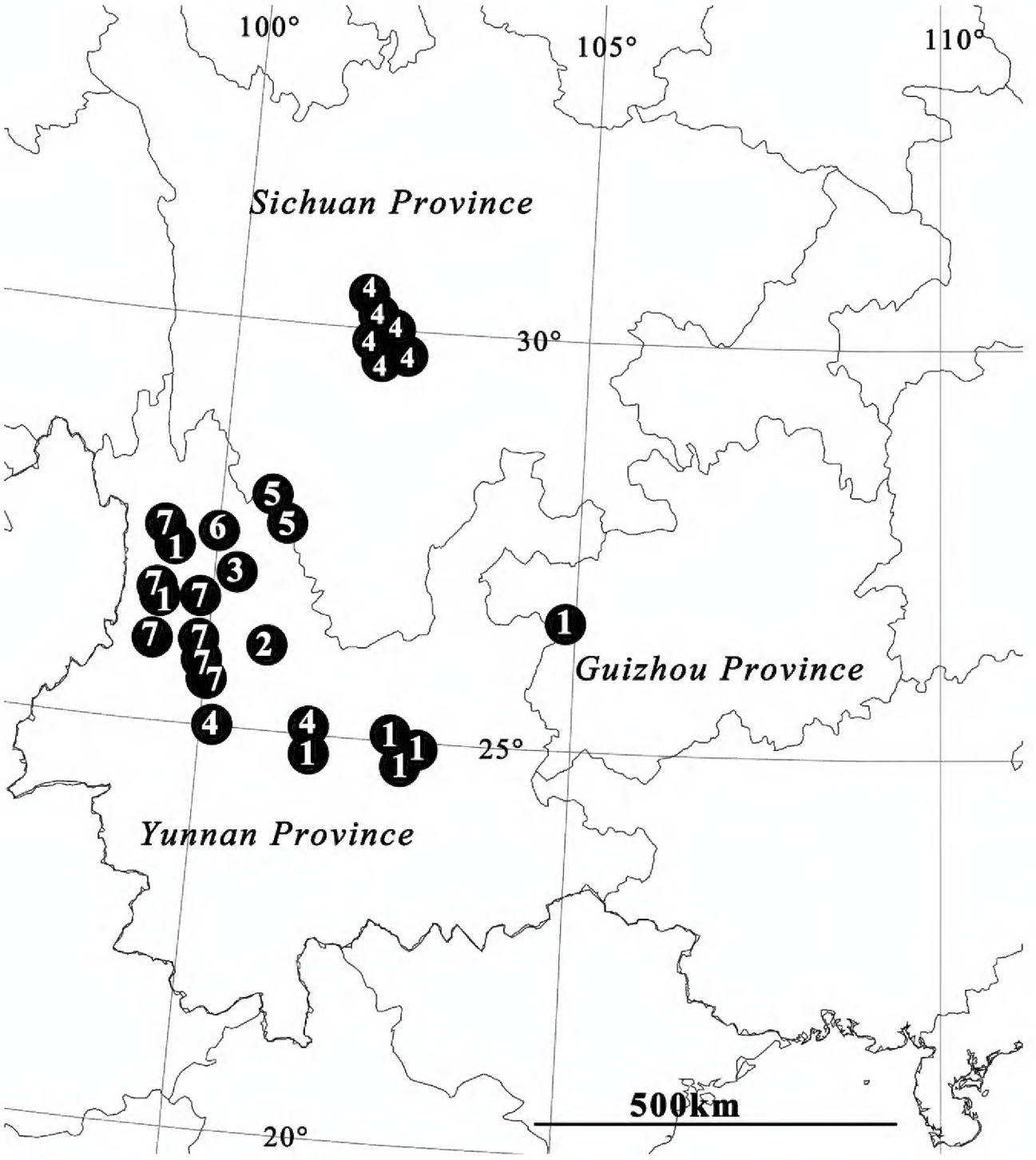

Figure 18. Locality records of *P. signata* group from China: **1** *P. bibulba* **2** *P. physematosa* sp. nov. **3** *P. semilunata* sp. nov. **4** *P. signata* **5** *P. wu* **6** *P. yinae* **7** *P. yunnanensis*.

Zhong & Xiaowei Cao leg. (CBEE, LJ01539-LJ01606); 18 males, 17 females, Dali Bai Autonomous Prefecture, Jianchuan County, Mt. Qianshi, 26.53°N, 99.88°E, 2647 m, 19 May 2014, Yang Zhong & Xiaowei Cao leg. (CBEE, LJ01501-LJ01534).

Diagnosis and Description. See Yang and Chen (2008).

Distribution. China (Yunnan) (Fig. 18).

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